

Changes of individual colour patterns in the Central American strawberry poison frog, *Oophaga pumilio* (Amphibia: Dendrobatidae)

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Abstract. As a result of skin injuries, the Neotropical strawberry poison frog (*Oophaga pumilio*) changes individual dorsal colour pattern including appearance of new and disintegration of old spots in the course of time. I hypothesize that melanin is deposited into the injured area to reduce solar radiation (UV) damage.

Key words. individual recognition, skin injuries, amphibians.

The use of individual patterns of spots or lines on the dorsal ground colour is a non-invasive method for individual recognition in frogs (HENLE et al. 1997). However, for optimal identification of specimens, the individual patterns are required to be stable over time. Here, I report the change in individual dorsal patterns of dark lines and spots in the Central American strawberry poison frog, *Oophaga pumilio* (Dendrobatidae).

Oophaga pumilio was observed between April 2005 and May 2006 at the Biological Reserve Hitoy Cerere, Costa Rica. Here, this polymorphic poison frog is dorsally red with irregular dark lines and spots. The study area (505 m²) was located in an abandoned banana plantation near the river Hitoy Cerere. At the beginning of the study, all adult frogs within the study area were captured and toe-clipped, a conventional marking method that apparently does not influence the behaviour of *O. pumilio* (PRÖHL 2002). Additionally, photos of each specimen were taken for re-identification via the individual dorsal patterns. During the study period we occasionally recaptured individual frogs and took photos to document changes of individual patterns.

Seventeen males and 52 females were found. In seven females and one male we were able to document changes of individual patterns via photos. We observed changes

with regard to the shape and size of dark spots and lines as well as appearance of new spots (Fig.1). Spots or lines also disintegrated in the course of months. In four cases (three individuals), we found that skin injuries caused the appearance of new spots (Fig.2).

Dark skin pigmentation in amphibians is caused by melanin which is synthesized by melanophores (BLAUSTEIN & BELDEN 2003). A major function of melanophores and melanin in skin is to inhibit the proliferation of bacterial, fungal and other parasitic infections of the dermis and epidermis (BLAUSTEIN & BELDEN 2003, MACKINTOSH 2001). Furthermore, melanophores are responsible for color changes associated with solar radiation (UV) exposure (BLAUSTEIN & BELDEN 2003). This might be an explanation for the appearance of new dark spots in damaged skin areas. Skin injuries causes higher UV exposure of the damaged area and melanin absorbs some of the potentially dangerous UV (BLAUSTEIN & BELDEN 2003). Deposition of melanin into the affected area might protect amphibians from damaging UV and, thus, increase survival rates of amphibians. Probably, after skin regeneration melanin is decomposed in the affected area and dark spots and lines begin to disintegrate. Although, further research is necessary to understand causes and consequences of changes of individual patterns

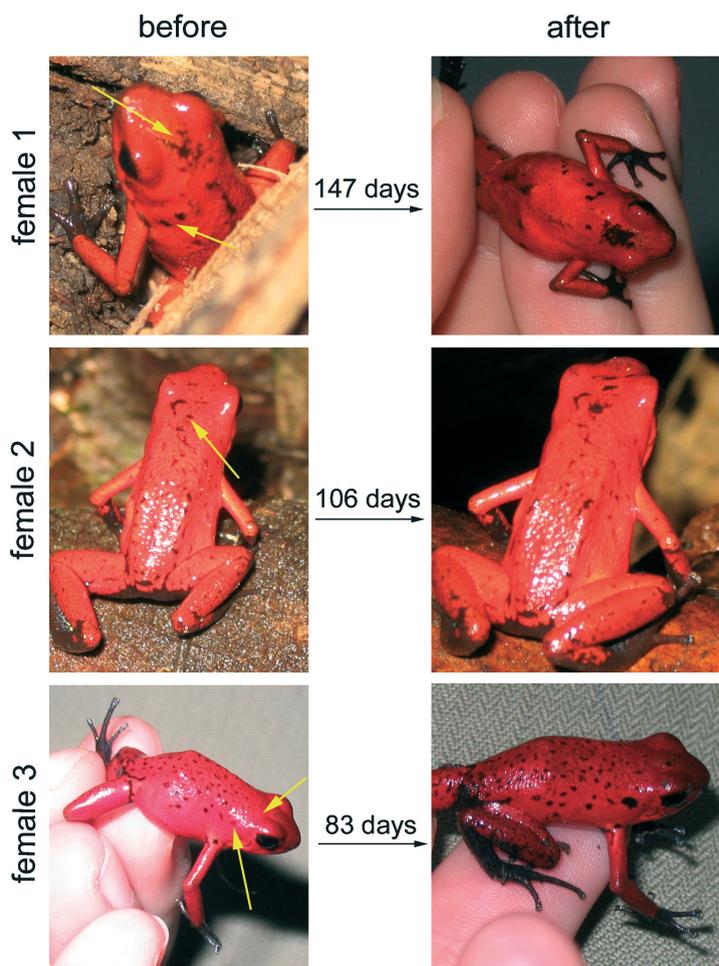


Fig. 1. Changes of individual patterns of dark lines and spots on the red ground colour in the strawberry poison frog, *O. pumilio*. Numbers between the photos represents the number of days between two successive shots. Yellow arrows mark the affected areas.

of spots and lines in the strawberry dart poison frog, one consequence is obvious: individual recognition based on dorsal patterns should be accompanied by a second method in *O. pumilio*.

Acknowledgements

Thanks to the government of Costa Rica (MINAE; Servicio de Parques Nacionales) for per-

mission to conduct the research in the Biological Reserve Hitoy Cerere (MINAE/SINAC permit No. 137-2004-OFAU, 038-2005-OFAU, 004 ASP AC/AC), especially the staff at the Biological Reserve for his support. For assistance in the field I would like to thank S. BECKER, U. FREISEN, F. GRÖZINGER, U. HARTMANN, A. KELLER, A. KRONHARDT, B. MARSCHALL, K. MOLL, E. MÜLLER, C. RAMENDA, I. SCHULZ and JAIRO. The German Academic Exchange Service (DAAD) supported this work.

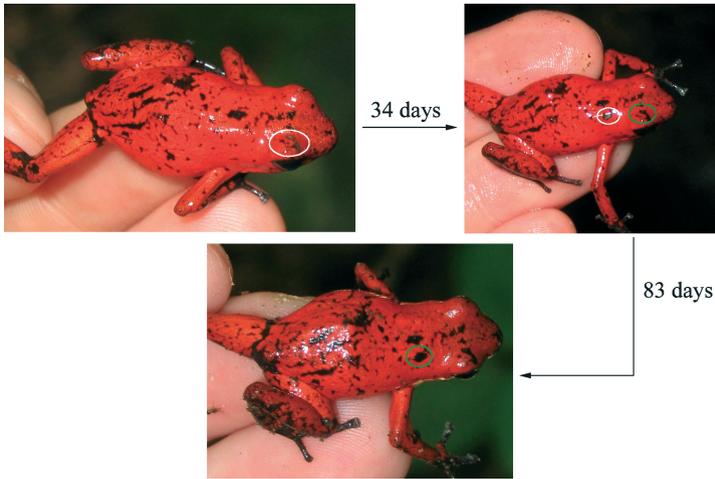


Fig. 2. Appearance of new dark spots in damaged skin areas of one female *O. pumilio*. Numbers between the photos represent the number of days between two successive shots. Skin injuries (light circles) caused the appearance of new dark spots (green circles).

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Manuscript received: 26 July 2008

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